

CHAPTER 2 IRWM PLAN OBJECTIVES

2.1 Objectives

The IRWM Plan primarily focuses on the projects and plans of the member agencies, with an emphasis on water supply and water quality. The key challenges facing South Orange County are reflected in each of the individual member agencies, with a focus on the following:

- Water Reliability
- Seasonal Storage
- Water Quality
- Water Recycling
- Watershed Management
- Environmental Protection
- Grant/Agency Funding

Long-term regional planning includes identification of enhanced local water supplies to offset reduction of imported water to meet demands during times of drought. Though many projects are planned over the next 10 to 20 years to help achieve this goal, much more long-term planning, as well as implementation of integrated projects in all categories included in this IRWM Plan, is necessary to reach that goal.

Identifying the long-term water supply and water quality issues facing the Region over the next 20 to 50 years enables the South Orange County agencies to more effectively plan for the projects necessary to meet these challenges. All project categories within this plan are essential to maximizing limited water resources, protecting water quality, and enhancing the environment. This integrated approach allows regional agencies to access available resources, diversifying water supply sources over a broad range of projects.

In order to address the major water challenges within the region, key objectives were compiled in the following categories:

1. Water Supply (WS)
2. Groundwater Management (GM)
3. Aquatic Ecosystems and Watershed Management (AE)
4. Water Conservation (WC)
5. Water Quality (WQ)
6. Sewage and Flood Management (SF)
7. Information Management (IF)

Where appropriate at the conceptual level of detail, objectives are described below quantitatively. For some objectives, quantifiable goals are more appropriately developed at the detailed strategic and/or project levels, as described in Chapters 3 and 4. Following each set of objectives is a discussion of management measures being implemented or planned to meet the respective objectives.

2.1.1 Water Supply Objectives (WS)

- Objective WS-1:*** Diversify the mix of water supplies to meet South Orange County's needs. This can be accomplished via water use efficiency efforts (see Section 3.3.4), developing local sources such as recycled water, groundwater and ocean water. In 2005, local sources including water conservation accounted for about 19% of supplies; by 2030 local resources are estimated to supply about 30% of total supplies. Total demands are projected to increase by about 36,000 AF, while imported water sources are projected to decrease by 17,000 AF. Imported sources will continue to provide the predominate source of water, and therefore the region must continue to work with MWDOC and Metropolitan to ensure the continued reliability of the import supplies.
- Objective WS-2:*** Improve South Orange County system reliability to enable the local agencies to provide sufficient water supplies to their customers during both planned and unplanned emergency outages of the import water system. This will be accomplished by developing storage, local resources and interconnections with other agencies or regions of the County to be able to continue meeting customers demands without the benefit of the imported water system for a minimum of 7 days at average demands by 2010 and increasing the ability to meet customer demands without benefit of the imported system to 20 days at peak summer demands by 2020.
- Objective WS-3:*** Reduce the vulnerability of water supply systems to droughts.
- Objective WS-4:*** Ensure that appropriate levels of investments are made to meet water supply, water system and water quality objectives. Over investment or under investment are inappropriate strategies for the South County Region. Water supply costs and retail rates will be developed to reward good water stewards and penalize water wasters.

Water Supply Development

South Orange County's water communities are facing increasing challenges in their role as stewards of the region's water resources. As population continues to increase, the Region requires additional investments to continue providing adequate quantities of high quality water for its customers. Water planning and development is required to continue on a statewide, regional, and local level as competition for water from outside the Region in areas such as Northern California and the Colorado River requires us to be ever more vigilant in protecting our resources and developing local resources to help meet our needs. Furthermore, environmental awareness and consideration for the natural processes vital to the Region have become influential features of comprehensive water planning.

A primary goal of the IRWM Plan is to present and discuss all water systems in a comprehensive and inclusive manner that indicates a regional understanding of the importance of an integrated planning approach. The continued development of projects and plans to pursue such a goal is vital to the economic and environmental health of the region. It is expected that this document will be updated as appropriate, and understood that as the Region advances, efforts to improve water supply, quality and reliability will expand. In this chapter, long-term regional planning is outlined with current information, though these strategies will continue to improve and develop over time.

The IRWM Plan lists a variety of projects, including infrastructure improvements, desalting and recycling projects, and water use efficiency programs that are planned for South Orange County. These projects are effective tools to generate not only drought year water supply, but “regular year” water supply as well. By cleansing tainted groundwater supplies or recycling wastewater, previously unusable sources of supply are available to meet water demands. While these new water supplies may not contribute directly to long-term storage, they help reduce reliance on imported water. For these reasons, more types of processing and storage facilities are needed to improve both system and supply reliability. Other planned projects, such as stormwater capture facilities, contribute directly to both short-term and long-term storage. Diversion of floodwaters to recharge basins or to storage for reuse will mitigate the dangerous characteristics of flooding as well as augment the available water supply. Watershed planning, including invasive species removal and other habitat restoration projects will enhance water quality and ecosystem vigor.

Imported Water Reliability

Watershed Water Supply and System Reliability Efforts by MWDOC

Approximately 94% of the watershed’s potable water supply is imported from Northern California and the Colorado River. This water is treated over 40 miles away at the Diemer Filtration Plant in Yorba Linda and delivered via two aging pipelines, the East Orange County Feeder No. 2 and Allen McColloch Pipeline. To ensure continued water reliability for south Orange County, 11 Orange County agencies, the Metropolitan Water District of Southern California (Metropolitan) and the U.S. Bureau of Reclamation joined together to fund the South Orange County Water Reliability Study (SOCWRS) - Phase 2 System Reliability Plan. System Reliability refers to having the facilities and flexibility to continue meeting consumer’s demands during relatively Short-term emergency outages of key facilities (7 to 30 days or so). Supply Reliability refers to being able to provide water under long-term drought or water shortage situations (over periods of years). Heading these efforts was the Municipal Water District of Orange County (MWDOC). The study area for the reliability evaluations is the same as for the IRWM Plan area. Funding and implementation of the projects is being pursued in a number of ways, including local participation, to support these critical water reliability projects.

MWDOC’s purpose in studying the system reliability issues were to:

- Identify risks, including earthquakes, that pose the greatest threat to the regional water treatment and distribution infrastructure that serves the project area

- Identify ways to bolster source-of-supply and regional distribution systems, building on earlier engineering investigations and studies
- Develop a list of projects that accomplish the above objectives, and identify appropriate investments
- Allow for flexibility in phasing. Most notably project operational dates and sizing should be flexible to account for changes in local resource development through construction of Local Resources Projects (LRPs).
- Develop and implement projects to improve system reliability. The planning work took into consideration a number of prior studies, including: SOCWRS Phase 1, which served as the foundation for this effort; Metropolitan's Central Pool Augmentation Project, currently in project and right-of-way refinement; Santa Margarita Water District's Lined and Covered Reservoir investigations to increase local storage for emergency needs; Irvine Ranch Water District's Water Resources Master Plan Update and Planning Area-6 Sub-Area Master Plan; and various Orange County Water District plans and groundwater basin operations studies.

To determine the economic impacts of water shortages, MWDOC retained the services of the Orange County Business Council. A separate report was prepared and the results are summarized later in this document. The economic impacts were found to range up to \$1.7 billion, depending on shortage scenario. Even a relatively short 10-day outage of 20% carries a projected impact of over \$60 million. These numbers illustrate the tremendous potential cost to the watershed from water system outages. Longer-term drought impacts were also evaluated in the analysis and resulted in even larger impacts.

Planning Principles

Key planning principles used to guide the formulation of alternatives and the Plan are:

- Develop priorities for accommodating Metropolitan planned shutdowns of 7 days of average demand and for emergency outages of up to 31 days of summer demand.
- Evaluate compatibility of project components with existing and future supply needs, with preference for projects providing multiple purposes, and seeking economies of scale through regional joint use facilities.
- Make better use of existing, underutilized infrastructure assets.
- Identify Metropolitan system investments that can provide for flexibility in system operation and to maintain and improve system capability and reliability for Orange County.
- Select appropriate projects that can be phased and modified to changing conditions.

Watershed Water Supply Risks and Scenarios

An emergency outage of the Diemer Filtration Plant, which is situated adjacent to the Whittier Fault, is judged to be the most severe supply risk to the watershed. In addition, there

are scheduled and sometimes urgent shutdowns of critical facilities that are necessary to make repairs and improvements.

One of these critical facilities, the Allen McColloch Pipeline, has experienced one major failure and two minor leaks since its construction in 1980 as well as having been shutdown at various times for inspection and repairs. The major failure occurred in December 1999 due to a pressure surge, and was repaired and restored to service in seven days by MET construction crews.

Finally, the East Orange County Feeder No. 2, a Metropolitan-operated pipeline, is considered to be in good condition, but it is aging, having been constructed in 1963. An outage of this pipeline has a smaller impact in south Orange County since the Allen McColloch Pipeline and South County Pipeline, the major extension of the Allen McColloch Pipeline into south Orange County, provides about 50% greater capacity than the East Orange County Feeder No. 2.

There are several faults in the area that could cause earthquake-induced failures. Of most significance is the Whittier-Elsinore Fault Zone and, to a lesser extent, the Peralta Hills Fault, San Joaquin Hills Thrust Fault, and the Newport-Inglewood Fault Zone. Knowledge of seismic forces has advanced significantly since the design and construction of the Orange County regional water treatment and distribution system, as well as design standards for protection of structures from major earthquakes.

The scenarios evaluated included Metropolitan planned shutdowns of the Diemer Filtration Plant, either a lower or upper Allen McColloch Pipeline emergency outage, and a Diemer Filtration Plant emergency outage. For the latter, the evaluation included sub-cases with and without implementation of the Central Pool Augmentation (CPA) Project by Metropolitan. The CPA Project has the greatest positive impact on the ability of south Orange County to withstand outages; however, its implementation is years away.

The scenarios were also evaluated with and without planned Local Resources Projects (LRPs). These projects, such as water recycling and groundwater desalters, reduce the extent of shortages, and therefore the number and size of reliability improvements that area required. The more local projects that can be developed help to provide improved reliability in the Region.

Estimated Shortages by Planning Scenario

Shortage estimates for planned shutdowns and emergency outages were determined and are summarized in Table 2.1.1-1. For planned shutdowns, under average demand conditions, a 7-day shutdown of all Metropolitan facilities serving south Orange County would result in a deficiency of 80 to 108 cfs in 2010 and 2025, respectively. To mitigate this shortage, between 950 and 1,500 AF of new storage or equivalent supply is needed. Under a Diemer Filtration Plant shutdown, needs are reduced to 59 cfs in 2010 with the use of other available supplies (Orange County Feeder, Baker Aqueduct and San Juan Capistrano's groundwater desalter (first phase in operation)).

For emergency outages, an array of shortage scenarios were reviewed, focusing on 10-day outages of the East Orange County Feeder No. 2, 10 to 31-day outages of the Allen McColloch Pipeline, and a 31-day outage of the Diemer Filtration Plant. The analysis bracketed the range of LRP implementation, from 0% to 100%.

Study results indicate that the most significant risks facing the watershed are outages of the Allen McColloch Pipeline and Diemer Filtration Plant. For these cases, shortage ranged from approximately 110 to 240 cfs. Placing these numbers in perspective, shortages for a summer outage in 2025 would range up to 86% of potable demand for a 31-day outage of the Diemer Filtration Plant.

The shortages evaluated assume meeting consumer demands. In times of emergency outages and inadequate supply, a necessary response can include demand curtailment. However, these types of actions come with economic and quality-of-life impacts and should not be considered a substitute for reliability improvements, since actual shortages may be longer in duration than those studied or be exacerbated by multiple failures.

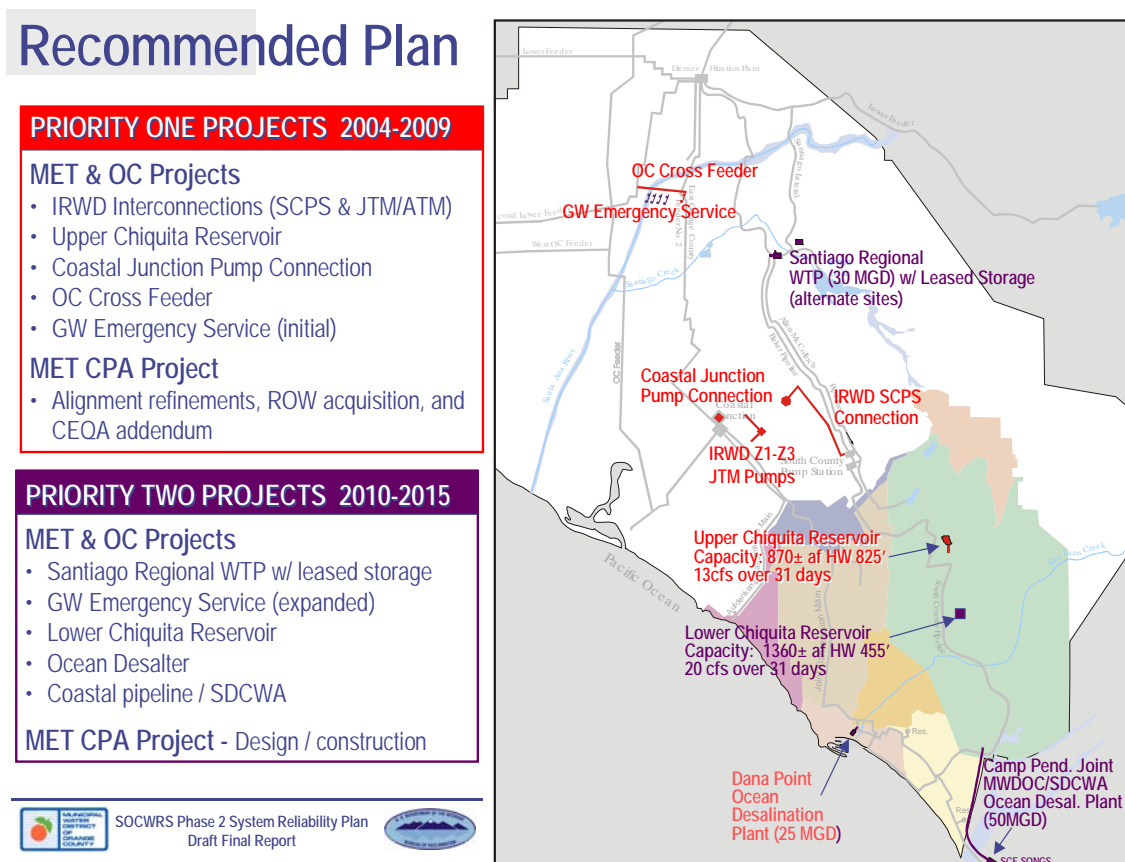
Table 2.1.1-1 Supply Shortages due to Planned Shutdowns and Emergency Outages				
Facility	Planned Shutdowns 2010 Average Demand		Emergency Outages 2025 Summer Demand	
	100% LRPs	0% LRPs	100% LRPs	0% LRPs
Diemer Filtration Plant 7-Day Shutdown Shortage Rate Equivalent Storage Percent of Demand	59 cfs ^[1] 818 af		189 cfs 11,640 af 80%	243 cfs 14,900 af 86%
Allen McColloch Pipeline 10-Day Outage Shortage Rate Equivalent Storage Percent of Demand 31-Day Outage Shortage Rate Equivalent Storage Percent of Demand			52 cfs 1,023 af 19% 63 cfs 3,854 af 26%	111 cfs 2,209 af 35% 116 cfs 7,119 af 41%
East Orange County Feeder #2 10-Day Outage Shortage Rate Equivalent Storage Percent of Demand			0 0 0	36 cfs 722 af 11%

* LRP's = Local Resources Projects planned for implementation by the local agencies

Projects Recommended for Implementation

The projects recommended for implementation fall into three categories and are the building blocks of the Base Plan and the Contingency Plan: (1) regional distribution system, (2) storage/treatment and (3) ocean desalination. The recommended projects are Base Plan or Priority 1 projects as outlined in the Figure 7 that are expected to minimize shortages and assume 100% of the LRPs are implemented. If fewer LRPs were implemented, then additional Contingency Plan or priority 2 projects would be necessary.

Figure 7
South Orange County Water Reliability Study – Phase 2 System Reliability Plan –
Recommended Plan



Implementation Phase for South Orange County System Reliability Projects

MWDOC has been working with the South Orange County water agencies to implement a variety of projects identified in the study work to improve system reliability. These projects are discussed below:

1. IRWD Interconnections

The concept involves making improvements to the IRWD system to enable water to be moved through the IRWD system and into South Orange County. Two issues have been analyzed, the first being the IRWD system conveyance capacity to move the water and the second being the source of water to move into South Orange County.

Potential points of connection for delivery include having the ability to move water to South Orange County under either of the two scenarios:

With EOCF#2 Outage

- Pump from the IRWD Zone 3 to the Joint Regional Transmission Main (JRTM) and flow from IRWD Zone 3 to the Aufdenkamp Transmission Main (ATM).

With AMP Outage

- Boost water across the IRWD system for delivery of water to the South County Pump Station, where it can be further boosted and delivered by Metropolitan.

Based on modeling work completed by IRWD, it appears that IRWD can potentially deliver 50 cfs or more through their system while meeting IRWD maximum month demands (considering only IRWD system conveyance capacity). The actual delivery capability will depend on the source of water (where it comes into the IRWD system) and supply capacity and the timing of system improvements to the IRWD system. The amount of capacity diminishes from a high of over 100 cfs to about 50 cfs in 2025 as demands build in the IRWD system. The following should be noted with respect to these projects. Fewer improvements are needed to deliver water into the EOCF#2. Considerably more improvements are needed to deliver water to the South County Pump Station. New local groundwater supply projects are being considered by IRWD.

Based on an analysis of existing IRWD local supplies and IRWD demands, it should be noted that locally developed groundwater supplies could be utilized during lower demand periods of the year when not needed within IRWD. These existing supplies currently total about 95 cfs and are planned for expansion in the next 5 to 10 years by about 18 cfs (Westside wells and Francis wells). IRWD almost always needs these supplies in the event of a Diemer outage during the hotter periods of the year. During a planned winter outage, 30 to 40 cfs may be available, but the amount declines over time to 20 to 30 cfs. In the event of an outage of only the AMP or only the EOCF#2, IRWD will likely have available supplies to share with South Orange County.

Other sources of water to move through the IRWD system into South Orange County includes MET supplies that are available through the Orange County Feeder into the 4th reach of the EOCF#2. This water can be taken by IRWD into their system and boosted to Zone 3. As much as 30 to 40 cfs of water may be available. The Groundwater Emergency Water Service Plan could add additional supply resources to this mix. It will be several years before these supplies might be available.

2. Upper and Lower Chiquita Reservoirs

MWDOC has been working with Santa Margarita Water District, lead agency, on the next implementation steps for these reservoir projects. To date efforts have centered on working with prospective South County water districts in determining participants and requested storage capacity. SMWD has retained geotechnical consultants to investigate the project sites and to develop preliminary engineering plans. SMWD is in the process of developing a participating agreement for the project.

3. Coastal Junction Pump Station

MWDOC is in the process of working with Metropolitan Water District in the design and specification of pump risers and electrical service to permit emergency generators to be used to pump water from the Orange County Feeder through Reach 4 back into the Joint Transmission Pipeline and/or Aufdenkamp Transmission Pipeline that serve South Orange County. This project would be able to pump about 20 cfs under emergency conditions.

4. Groundwater Emergency Service Program

Planning work is in progress on this program to provide emergency deliveries of groundwater to South Orange County under periods of outage of either the Diemer Treatment Plant and/or both the primary delivery pipelines. Policy discussions have been held with the Joint Planning Committee of the Orange County Water District and MWDOC Board of Directors. A working group of key agency managers has been established to develop policy principles and project concepts. The concept being considered would be either an investment in new local agency wells and connection to the EOCF#2 or into an OCWD coastal pumping shift wellhead that would deliver water from inland areas to coastal areas via the Metropolitan EOCF#2.

5. Orange County Cross-Connector

This project would connect the Second Lower Feeder with the EOCF#2 in Mira Loma Street in Anaheim to allow deliveries from the Jensen Treatment Plant into South Orange County during periods when the Diemer Treatment Plant is out-of-service for shutdowns, outages, or other reason or to accommodate increased deliveries of State Project water into South Orange County. This project is being proposed to be included in the FY06 Metropolitan capital investment program budget. Alignment studies have been completed by Metropolitan and a preferred alignment has been recommended. This project is planned to be on-line in 2008.

6. Ocean Desalination (Dana Point and Camp Pendleton)

The Dana Point Ocean Desalination Project is being investigated at this time to determine whether an ocean desalination plant can be successfully constructed and operated at the South Coast Water District site in Dana Point. Investigations at this time include determination of the adequacy of the underground alluvial formation to support a sufficient yield of seawater, determination of adequate brine disposal capacity in the

South Orange County Wastewater Authority (SOCWA) outfall, and evaluation of energy supply for the project.

The Phase I Hydrogeology Investigation fieldwork was completed in March 2005. Four boreholes were drilled in Doheny State Beach. Two of those boreholes were completed as nested monitoring wells near San Juan Creek in the North Day Use area. The monitoring wells were completed in the shallow aquifer, the main aquifer and the deeper zone. The shallow aquifer is in hydraulic continuity with the baseflow of San Juan Creek. Chemical as well as bacteriological sampling will be conducted quarterly at these two monitoring wells over the next year.

The Phase II Hydrogeology Investigation will be conducted during the winter of 2005/06. This work includes construction of a test slant well using Horizontal Directional Drilling (HDD) technology combined with installation of a pre-packed screen out under the ocean from near the monitoring well location. This work will determine the hydrogeology and water quality, as well as providing research and development information for full-scale HDD subsurface well intake system design and construction.

Other planning efforts underway by MWDOC include the following projects:

Central Pool Augmentation Project: MWDOC is working with Metropolitan at this time to further evaluate the timing and need for the project to provide additional treated water into the Central Pool Service Area portion of Metropolitan's system and further to fully understand the reliability implications this project would have for South Orange County. The Central Pool Augmentation Project involves construction of a new treatment plant at the Eagle Valley site in Riverside County near Lake Mathews and construction of a conveyance facility into South Orange County. Options for the conveyance include an 11-mile tunnel system through the Santa Ana Mountains and a northern pipeline alignment around the Santa Ana Mountains. The project timing is somewhat tenuous at this time and ranges between 2020 and 2030 for start-up, based on the need for treated water demands. Based on the need for system reliability, the project is needed to back-up South Orange County at this time. The project is estimated at around \$1.2 billion. Additional work on the tunnel and northern alignment are planned along with a revised timing analysis.

Metropolitan Infrastructure Reliability Protection Projects: Metropolitan is in the process of evaluating their distribution system and treatment plants to better understand their system reliability risks. MWDOC is supportive of these efforts. A major effort is being made to examine the seismic forces that could be exerted at the Diemer Plant from a movement of the Whittier fault to determine potential areas for improvement. An outage of the Diemer Filtration Plant is the most serious problem for Orange County.

Coastal Supply Line Connecting South Orange County to North San Diego County: Metropolitan, MWDOC and San Diego County Water Authority are working on a study effort to determine the potential benefits of linking the South Orange County distribution system with the North San Diego Distribution system with a pipeline across Camp Pendleton.

The study is recently began in April 2005 and is expected to be completed by the end of the 2005.

Surface Water Development

Limited surface water is available as a potable or non-potable source, as surface flow is required for riparian habitat preservation and key for groundwater recharge. Generally, the heaviest flows in regional watersheds occur primarily in the winter and spring with seasonal rains and snow melt. Groundwater basin recharge rates vary by the geological characteristics of each creek. Finer grained sediment at the bottom of a creek bed provides less opportunity for deep percolation. Therefore, the greatest opportunities for surface water development exist in the reduction and treatment of pollutants to improve water quality for both the affected habitats and groundwater basins. Projects such as Santa Margarita Water District's Gobernadora Basin and Trabuco Canyon Water District's Groundwater Treatment Plant are two of the proposed projects that illustrate the importance of comprehensive surface water development.

In the IRWM Plan, two creek diversion or water reuse projects are proposed, one at Oso Creek and the other at Aliso Creek. Both projects offer significant benefits to the watersheds by managing and improving the downstream flows to maintain the corridor habitats and to improve the quality of water to be percolated in addition to the harvesting of source water to augment regional supply.

Water Recycling

Water recycling has long been regarded as a cost-effective water supply alternative in Orange County. Recycled water in the County is used to irrigate crops, golf courses, parks, schools, business landscapes, residential lawns, and some industrial uses. Local water recycling projects involve the collection of wastewater that is currently being discharged within the service area, treating that water to a suitable standard for specific uses, and substituting the recycled water for existing or future potable water demands. The projections for expanded development of this type of water recycling are based upon several "institutional assumptions" that vary depending on the end use of the recycled water. Development of recycled water projects generally requires creative solutions to funding, regulatory requirements, institutional arrangements and public acceptance.²²

At a regional level, studies of water recycling opportunities within the southern California area provide a context for promoting the development of water recycling plans. The Southern California Comprehensive Water Reclamation and Reuse Study analyzed 15 geographical areas for short term project implementation, two of which were located in South Orange County. The 'Upper Oso' short term implementation plan, as described by the report, indicates a need for regional agencies to continue to expand and connect the recycled water distribution systems as a collaborative effort. These agencies would include Santa Margarita Water District, El Toro Water District, Moulton Niguel Water District, and South Orange

²² Municipal Water District of Orange County, 2000, *Regional Urban Water Management Plan Update*.

County Wastewater Authority. Sensitivity analyses for the ‘Upper Oso’ region demonstrated that this implementation plan would result in robust benefits remaining positive across a wide range of assumptions for estimated project costs or the avoided wastewater and water supply costs. The second region identified in the study was the ‘San Juan’ region, which includes the recycled water systems of the City of San Clemente, the City of San Juan Capistrano, the Santa Margarita Water District and the South Orange County Wastewater Authority. This region is also recommended to expand and connect the recycled water systems of the area to create a more reliable water supply. The net economic benefits are positive. However, there are issues that need resolution in the ‘San Juan’ region, including the equitable distribution of cost and flows from the Jay B. Latham Wastewater Treatment Plant, and the renovation of the facility itself, which is addressed in this Plan as a part of Chapter 4.

The Southern California Comprehensive Water Reclamation and Reuse Study also identified a long term strategy for the entirety of Orange County. The long term analysis in the Orange County region consisted of increasing reuse at six of the wastewater treatment facilities and one of the reservoirs in the area. This increased flow is expected to satisfy approximately 52,500 acre-feet per year of new demand by 2040, considered the maximum goal attainable, and is being used as a guideline for local reuse. The Orange County region Long-term strategy described in the report would also establish connections between the seven treatment facilities and reservoirs located in South Orange County to create one regional system.²³

Some regional funding for system improvements and expansions is available through the Metropolitan Water District, which provides rebates for the development of cost-effective water recycling and groundwater recovery projects that reduce the demand for imported water supply and improves regional water supply reliability. Metropolitan is currently participating with MWDOC on four projects in South Orange County. Those are the Moulton Niguel Water Reclamation Project, the Santa Margarita Water Reclamation Project, City of San Juan Capistrano Non-Domestic System, and the Trabuco Canyon Water Reclamation Expansion Project.

Recycled water use can also be increased by requiring dual piping in new developments, retrofitting existing landscaped areas, and constructing recycled water pumping stations and transmission mains to reach areas far from treatment plants. However, the additional costs, large energy requirements and new facility requirements make such projects very expensive to pursue. To optimize the use of recycled water, cost/benefit analysis must be conducted for each potential project. As previously discussed, the Southern California Comprehensive Water Reclamation and Reuse Study has shown that the net benefits are far greater than the direct costs.²⁴

²³ Department of Water Resources et. al., 2002, *Southern California Comprehensive Water Reclamation Study, Phase Two Final Report*.

²⁴ Municipal Water District of Orange County, 2000, *Regional Urban Water Management Plan Update*.

2.1.2 Groundwater Management Objectives (GM)

Objective GM-1: Balance groundwater pumping with increased recharge capabilities to fully utilize the storage capability of the groundwater basins in South Orange County. Over the planning period through 2030, it is expected that the recharge capability and pumping capability of the San Juan Basin will be increased by about 7,500 AF, beyond the current 2005 dependable yield capacity of 7,300 AF. It may be possible to increase the yield above this amount for additional dry-year yield with a plan for recharge and recovery of the basin. The existing operation of the basin will have to be monitored for several years with the San Juan Basin Project in operation to ensure that there will be no adverse effects.

Objective GM-2: Protect groundwater from contamination.

Groundwater Management

With the Region's dependence on imported water to serve water demands, the need for local storage intensifies. One of the most effective forms of storage in a dry and arid climate is conjunctive use, wherein water is stored underground during wet periods and pumped out during dry or drought periods. Limitations to such storage include available resources such as basin storage capacity, pumping capacity, recharge capacity, water quality and institutional constraints. Despite these challenges, conjunctive use storage is a far less expensive and non-intrusive alternative to surface water storage.

The total calculated storage capacity of the San Juan Creek Groundwater Basin is estimated to be 90,000 acre-feet. Some of the storage capacity cannot be used because of potential sea water intrusion, economic reasons, or poor water quality. The San Juan Basin is a shallow basin that has been categorized as an underground flowing stream which also limits storage capabilities.²⁵

Groundwater sources are highly desirable in terms of water quality, cost, utilization of local energy resources, and also contribute to the Region being less dependent on imported water supplies on an overall basis. However, they are subject to interruption during drought conditions that occur, therefore projects dedicated to recharge efforts and groundwater quality measures are of particular significance to the regional water supply. The groundwater within the lower San Juan Basin generally requires treatment for potable use.

Groundwater supply is being developed through the desalter project initiated by the City of San Juan Capistrano and the San Juan Basin Authority. The Phase I facilities were completed in December 2004, and the City of San Juan Capistrano is currently receiving 4,800 acre-feet

²⁵ Department of Water Resources, 1972, *Bulletin No. 104-7, Planned Utilization of Water Resources in the San Juan Creek Basin Area*.

per year of potable water from this supply. Completion of Phase II will increase the supply to at least 10,000 acre-feet per year. The South Coast Water District also anticipates completion of a groundwater recovery system to operate on the San Juan Creek Groundwater Basin in 2007. Initial production is expected to be 800 acre-feet per year, with potential to increase in the future.

Groundwater recharge of the San Juan Groundwater Basin occurs naturally at a rate of approximately 10,500 acre-feet per year.²⁶ However, as groundwater pumping programs develop, the natural rate of recharge will need to be monitored and augmented. Phase II of the San Juan Basin Authority desalter project includes recharge facilities. Completion of Phase II of the project will provide sufficient pumping and desalting capacity for short-term drought and emergency protection.

2.1.3 Water Conservation Objectives (WC)

Objective WC-1: Reduce water demand by 9,700 AF in 2005 increasing to more than 19,600 AF in 2030 through the implementation of Best Management Practices water use efficiency measures. The net increase due to Water Use Efficiency practices is expected at about 10,000 AF or more between 2005 and 2030.

Demand Management/Water Use Efficiency

Demand management consists of conservation programs and demand curtailment. It is a long-term means to extend the availability and reliability of existing supply. Curtailment or rationing is a viable option for short-term supply shortages, which may include limiting potable landscape meters during emergencies. However, the more important issue for long-term regional water supply is water use efficiency (WUE).

As signatories to the Memorandum of Understanding containing 14 Best Management Practices (BMPs) for urban water conservation in California, MWDOC and south Orange County water agencies are voluntarily committed to the implementation of all cost effective BMPs. Examples of BMP's include Home Water Surveys, Low-Flow Showerhead and Toilet Retrofits, Clothes washer Retrofits, Landscape Irrigation Budgets, Education, Public Information, Industrial Process Water Improvements and Water Waste Prohibitions.

Water agencies throughout the County have provided incentives for the installation of more than 350,000 Ultra-Low-Flush Toilets, which are saving more than 11,700 AF of water per year. In addition, more than 75 percent of the showerheads have been replaced with low-flow heads. As a result of these BMP implementation efforts, indoor residential water saving opportunities are nearly exhausted. Public Information, School Education, Conservation Pricing and metering with Commodity Rates are considered ongoing WUE efforts but area non-quantifiable in terms of water savings. Outdoor landscape irrigation water savings plumbing fixture retrofits in local businesses are the regions' next major areas of focus to

²⁶ Army Corps of Engineers, 2002, *San Juan Creek Watershed Management Study*.

achieve quantifiable water savings. These savings will be achieved through incentives to install weather-based irrigation timers, irrigation system distribution uniformity improvements, design changes including plant palette.

Orange County's Residential Runoff Reduction Study documented significant water savings, runoff reduction and pollution prevention benefits from the installation of self-adjusting Weather Based Irrigation Timers in single-family homes and commercial landscapes. This study was the basis for the first regional implementation program in the State offering rebate incentives to customers to install up to 5,000 Weather Based Irrigation Timers.

If fully implemented in south Orange County, the maximum water savings potential associated with installation of these technologies in single-family homes and commercial landscapes is estimated at more than 13,500 acre-feet per year. As described in Chapter 4, MWDOC has proposed immediate expansion of the pilot rebate program designed to target approximately 30% or 4,862 acre-feet per year of the maximum savings potential.

Other WUE programs continue to be implemented by the individual water districts as well. Educational classes and literature are made available to consumers in each school district. Examples of programs include water conservation workshops for homeowners, rebate programs for installation of water saving technologies, and professional landscape training and certification classes. Future potable water use efficiency in South Orange County will reduce water demand and the level achieved will be the result of several factors, including program investments, consumer acceptance, advancements in technology, etc.

WUE is an effective and reliable component to reducing regional reliance on imported water as the population of south Orange County continues to grow. MWDOC estimates indicate that by the year 2030, water supplies made available through conservation efforts will total 19,264 acre-feet per year as illustrated in Table 2.1.3-1 below, an increase of about 10,000 AF over and above existing Water Use Efficiency levels achieved in 2005. More aggressive efforts could possibly save additional water.²⁷

Table 2.1.3-1
Total Projected WUE / Water Conservation Projects and Water Savings (AFY)

Type of WUE Project / Program	2005	2010	2015	2020	2025	2030
Active WUE	2,389	3,111	3,653	4,226	4,919	5,762
Passive WUE	7,301	8,943	10,255	11,331	12,529	13,862
Total WUE	9,700	12,054	13,908	15,557	17,448	19,624

Source: MWDOC, May 2005

²⁷ Municipal Water District of Orange County, 2004, *South Orange County Water Reliability Study Phase 2*.